Energy for the Future

Activity 12: Rain Machine

Activity 12 **RAIN MACHINE**

CONCEPT Solar energy can help purify water.

GOAL Students will see how impure water can be made clean using solar energy.

MATERIALS Items listed in bold type must be supplied by the teacher. 1 large plastic cup, 1 smaller paper cup, clear plastic food wrap, **small rock**, **salty water** (you may want the students to prepare the salty water)

ACTIVITY

INVITE

1. Ask students if they have ever taken a drink of seawater. As the human population continues to grow, the available fresh water supply becomes smaller. If the fresh water supply gets smaller, is there a way we can make seawater drinkable? Present students with a problem: if they were lost in a desert with no fuel or water, and the only water was in a salty pond, how could they survive?

2. Ask them if they know of a way to change saltwater into fresh water. Is there a renewable energy source that could be used? [solar energy] This may be an abstract question, but present it to them as "food for thought." (The process involves evaporation.)

EXPLORE, DISCOVER

3. Have students work in pairs. Have them fill a large plastic cup to a depth of 2 cm (about 1 inch) with salty water. Place the empty small paper cup inside the large cup. It will float.

4. Cover the plastic cup with clear plastic. Secure it tightly with a rubber band.

5. Put a small rock on the plastic wrap to make it sag in the middle, but don't let the rock touch the salt water or tear the plastic wrap.

6. Place the cup on a tray and put the tray in the sun (or outside if possible. As the water evaporates, notice the tiny droplets that condense on the cool plastic wrap and run down into the cup.)

ANALYZE DATA

7. After 3-5 days, check the cups by removing the plastic wrap. You can let students drink the water in the inner, small cup.

8. Discuss what happened. Write the word **evaporation** on the board. Ask them what happens to rain on a sidewalk after the sun comes back out. It doesn't "disappear" but it goes into the air as **water vapor**. This water vapor is the pure form of water. When water evaporates, it doesn't take any of the salts or minerals with it--just plain water. The salt is left behind.

ASK NEW QUESTIONS

9. How has renewable energy been used in this experiment? Where might you apply this "technology" on a big scale? Refer back to the problem asked in question #1.

10. Why does this water taste differently from tap water? What is in tap water? Have a student contact the city government to get the phone number of a supervisor of the water plant. Ask what minerals are in tap water.